

REMARKS

Applicants respectfully request further examination and reconsideration in view of the above amendments and arguments set forth fully below. Claims 1, 2, 3-10, 15-23, 26-32, 35, 39-43 and 45-51 were previously pending in this application. Within the Office Action, Claims 1, 2, 4-10, 15-23, 26-32, 35, 39-43, 45-47 and 51 have been rejected and Claims 48-50 have been withdrawn from consideration. By way of the above amendments, Claims 1, 9, 26, 32, 35, 40, 45 and 51 have been amended and Claims 48-50 have been canceled. Accordingly, Claims 1, 2, 4-10, 15-23, 26-32, 35, 39-43, 45-47 and 51 are now pending in this application.

Rejections Under 35 U.S.C. § 102(b)

Within the Office Action Claims 1, 4, 8, 9, 40-43 and 45-47 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,323,468 to Bottesch (hereafter "Bottesch"). Applicants respectfully disagree for the following reasons.

Bottesch wholly lacks the feature that the transducers are positionable at multiple locations on said support (emphasis added), recited in the independent Claims 1 and 32.

Bottesch wholly lacks the feature of transmitting music through the user's head by transcutaneous bone conduction through the polymeric material while the user's head is under water as recited in independent Claim 40.

As set forth in Claims 1 and 32, a particular aspect of the invention is drawn to an audio device for providing music to a user, which includes (a) transducers for generating the music from musical signals and (b) a support for holding the transducers in vibratory contact with a user's head, wherein each of the transducers is positionable at multiple locations on said support (emphasis added). With reference to Figure 3a, an example of the transducers 2 being slidable along the support 1 is shown. With reference to Figure 3b, an example of the transducers 2 being positionable at multiple locations on support 1 is shown. With reference to Figure 3c, an example of transducers 2 being positionable at multiple locations on a length of velcro on the support 1 is shown.

As noted previously, proper fitting and placement of transducers on a user's head is complicated. It is particularly complicated when the device will be used in a pool where the user will be moving through water. There are great inter-subject differences found with respect to the transcranial attenuation of vibrations generated between the mastoid processes. Thus, the vibrations of the human skull differs depending on skull shape and skull density. Variations in bone conduction quality can occur due to differences in the amount of soft tissue interposed

between the vibrator and skull. Thus, the contact area of the transducer influences the transmission efficiency through the skin. Larger contact areas have better transmission properties.

For some, mastoid location may not be an optimal location for bone conducted sound. For instance, at low frequencies of approximately 200 Hz when stimulating at the forehead, the skull conducts vibrations as a rigid body. At 800 Hz, the forehead and occiput vibrate in opposite phases. At 1600 Hz, the two temporal regions vibrate in opposite phase, and the head and neck regions also vibrate with opposite phases. Further, the activity (e.g., swimming) may make the mastoid location less than optimal. To accommodate for a user's specific cranial anatomy and to optimize sound quality, an audio system suitable for use in, for example, an aquatic environment preferably includes transducers that can be repositioned to alternative locations on the user's head.

For convenience, Figure 5 of Bottesch is reproduced below. It can be seen that the transducers 90, 92, and 94 are at fixed locations at the end of the frame 12. There is no mechanism whatsoever in Bottesch to move any of the transducers 90, 92, and 94 to a different location on frame 12. Rather, in Bottesch, the transducers 90, 92, and 94 are designed to not be moved from the ends of various branches of frame 12. Bottesch does not recognize a need for moving the transducers on the frame, and contemplates only placing the transducers 90, 92 and 94 in contact with the mastoid region of the skull (as is discussed in the present application at page 3, lines 15 et seq.). The invention provides a robust solution which has particular application in the aquatic arena, but which has application in other areas. In particular, to accommodate for a user's specific cranial anatomy and to optimize sound quality, the invention provides an audio system that includes transducers that can be repositioned to alternative locations on the user's head.

Also with reference to Figure 5 of Bottesch, it is noted that Bottesch does not show or suggest an underwater application. As stated within the Office Actions, Bottesch does not teach a waterproofing material. Hence Bottesch does not anticipate the method steps of Claim 40 which require use of the device under water.

However, in order to further advance the prosecution of the application, both of the independent Claims 1 and 40 have been amended to recite a support structure with a band or a band for positioning transducers at locations against a user's head. This additional feature is also neither taught nor suggested by Bottesch. For at least these reasons, the independent Claims 1 and 40 are now both allowable over the teachings of Bottesch.

Claims 4, 8 and 9 are all dependent on the independent Claim 1 and Claims 41-43 and 45-47 are all dependent on the independent Claim 40. As described above, the independent Claims 1 and 40 are both allowable over the teachings of Bottesch. Accordingly, Claims 4, 8, 9, 41-43 and 45-47 are also all allowable as being dependent on allowable base claims.

Rejections Under 35 U.S.C. § 103(a)

Claims 2, 5-7, 10, 15-23, 26-32, 35, 39-43, and 45-47 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Bottesch.

By way of the above amendments, the independent Claim 32 has been amended to recite a band which fits around a user's head and holds the transducers in contact with a plurality of locations around the user's head. Again, this additional feature is neither taught nor suggested by Bottesch.

For all the reasons described above, each of the independent Claims 1, 32 and 40 is now allowable over the teachings of Bottesch. Claims 2, 5-7, 10, 15-23, 26-31 are all dependent on the independent Claim 1; Claims 35 and 39 are both dependent on the independent Claim 32; and Claims 41-43 and 45-47 are all dependent on the independent Claim 40. Accordingly, Claims 2, 5-7, 10, 15-23, 26-31, 35, 39, 41-43 and 45-47 are all also allowable as being dependent upon allowable base claims.

For the reasons given above, Applicants respectfully submit that Claims 1, 2, 3-10, 15-23, 26-32, 35, 39-43, 45-47 and 51 are now in a condition for allowance, and allowance at an early date would be appreciated. Should the Examiner have any questions or comments, the Examiner is encouraged to call the undersigned at (408) 530-9700 to discuss the same so that any
5 outstanding issues can be expeditiously resolved.

Respectfully submitted,
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Dated: 3/28/07

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